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57 A brush for applying mascara or the like comprising bristles clamped between a pair of helically twisted metal wires, which form the brush core (11), has a bristle array with a discontinuous profile including an arrowhead-shaped distal portion (28) and contiguous portion (32) of cross-sectional area smaller than the maximum cross-sectional area of the distal portion (28).



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This invention relates to bristle brushes for applying cosmetics such as mascara or the like.

For purposes of illustration, the invention will be described as embodied in mascara brushes of the type having an axially elongated twisted wire core with a multiplicity of fibers such as bristles clamped at their midpoints in the core and extending radially outwardly therefrom to form a brush bristle array surrounding the core over a substantial portion of the length of the core, typically to the outer (distal) end of the core. The core is constituted of two lengths of wire, which may be initially separate or may be opposed legs of a single U-shaped wire, twisted together into an axially rectilinear helix to hold the bristles between them. This combination of a twisted wire core and a radiating array of bristles clamped in the core provides a simple, low-cost and effective brush structure for uses exemplified by the application of mascara.

Such mascara brushes are well known and widely used in the cosmetics industry. Commonly, the proximal end of the brush is mounted within the threaded cap of a mascara container, so that the brush projects into the container when the cap is in container-closing position. Upon removal of the cap, the brush carries a quantity of mascara out of the container, and is manipulated to deliver and apply the mascara to the user's eyelashes, the cap serving as a handle for the brush.

In conventional mascara brushes having the described twisted-wire-and-bristle construction, the overall profile of the brush bristle array (such profile being the notional envelope defined by the bristle extremities) is ordinarily cylindrical and/or smoothly tapering, with progressively shorter bristles, toward the distal end of the brush. The bristles within the profile may be arranged in discrete though closely spaced helical rows corresponding to the helical turns of the wire core, or they may be distributed substantially uniformly. In either case, any given brush has essentially only a single set of applicator characteristics (shape, dimensions, bristle stiffness, etc.). The application of mascara, however, involves diverse functions and operations, including pickup, transport and deposit of the mascara; combing of the lashes; and even distribution of the applied mascara. The applicator characteristics of a given conventional brush do not perform all these various functions and operations equally well.

It has heretofore been proposed to provide two implements, such as a brush and a comb, for separately performing the diverse functions involved in applying mascara. The provision of two implements adds to cost and detracts from convenience of use; furthermore, as it is usually not feasible to enclose more than one implement in a mascara container, one of the implements must be left exposed (when not in use) to contamination outside the container.

An object of the present invention is to provide a

bristle brush, for applying cosmetic material such as mascara or the like, combining within a single structure diverse applicator characteristics respectively suited to the performance of specifically different functions in the application of the cosmetic material. The brush may be capable of being enclosed within a container of the material when not in use.

The present invention broadly contemplates the provision of a brush wherein the bristle array has a discontinuous profile including at least two axially extended portions differing from each other in cross-sectional shape and/or size. The brush preferably comprises an axially elongated twisted wire core having a proximal end and a distal end, and a multiplicity of bristles clamped in the core and extending radially therefrom to constitute a brush bristle array projecting outwardly around the core over a substantial part of the length of the core.

As a particular feature of the invention, a first one of the two portions is a generally conical or arrowhead-shaped distal portion of the bristle array having a maximum cross-sectional area at its proximal end and tapering therefrom toward the distal end of the wire core; and a second one of these portions, contiguous to and disposed proximally of the first, has a uniform cross-section smaller in at least one dimension than the cross-section of the proximal area of the first portion, such that there is a discontinuity of bristle array profile between the first and second portions.

In one embodiment of the invention, the bristles of the second portion are cut to provide a profile having an elongated rectangular cross section of length preferably equal to the maximum cross-sectional diameter of the arrowhead-shaped first portion. That is to say, the bristles of an array extending radially from a wire core are cut to a profile of elongated rectangular cross section with a conical, arrowhead-shaped tip, with the base of the conical tip extending from the rectangular cross section and advantageously having a diameter substantially equal to the longer side of the rectangular cross section.

In a second embodiment, the bristles of the second portion are cut to provide a cylindrical profile of small cross-sectional diameter (short bristle length) coaxial with the wire core, and the bristles of the first portion are cut, in progressively varying lengths, to provide an enlarged arrowhead-shaped tip disposed eccentrically of the wire core with a maximum cross-sectional diameter substantially larger than the first-portion diameter.

Further features and advantages of the invention will be apparent from the detailed description hereinbelow set forth, together with the accompanying drawings.

Fig. 1 is a side view of a mascara brush embodying the present invention in a particular form; Fig. 2 is a view taken on line 2-2 of Fig. 1; Fig. 3 is a view taken on line 3-3 of Fig. 1;

Fig. 4 is an enlarged fragmentary side view of another embodiment of the invention; and

Fig. 5 is an end view of the embodiment of Fig. 4.

Referring to the drawings, in which like numerals designate like elements throughout the several views, each of the two embodiments therein shown includes a generally conventional brush structure 10 comprising an elongated, axially rectilinear core 11 constituted of a helically twisted-together pair of metal wires 12, 14, and a multiplicity of fibers or bristles 16 clamped at their midpoints between the wires 12, 14 and extending radially outwardly therefrom to form a brush bristle array 18 surrounding the core over a substantial portion of the length of the core. The manufacture and arrangement of such structures are well known in the art, and need not be further described. It will be understood that the wires 12 and 14 may be separate lengths of wire, or opposed legs of a single initially U-shaped wire. The core 11 has a proximal end 20, and a distal end 22 to which the bristle array extends; end 20 is mounted in a stem 24 extending from (and secured within) an internally threaded container cap 26.

As thus far described, the brush structure 10 may be generally conventional. A conventional brush, however, would have a continuous, smoothly, cylindrical and/or tapering bristle array profile. In accordance with the present invention, in the embodiment of Figs. 1-3, the bristles in the distal portion 28 of the array 18 are trimmed to a conical or arrowhead shape, coaxial with the core 11 and tapering distally, such that the maximum cross-sectional area (region of longest bristles) of portion 28 is at the proximal end 30 of that portion. As best seen in Fig. 2, the cross section of end 30 (the base of the arrowhead) is circular. The bristles of the remaining, proximal portion 32 of the array 18 are trimmed to a profile of elongated rectangular cross section (Fig. 3) with a short cross-sectional dimension designated 34 and a long cross-sectional dimension designated 36. Dimension 36 is about equal to, and dimension 34 is substantially shorter than, the cross-sectional diameter of the arrowhead base 30.

The arrowhead or conical tip portion 28 and the rectangular-cross-section portion 32 of the bristle array are disposed in contiguous tandem relation along the wire core 11. Thus, on opposed sides of the brush (where the shortest cut bristle of portion 32 are located), there is an abrupt discontinuity of bristle array profile at the juncture of the proximal end (arrowhead base) 30 of portion 28 with the distal end of portion 32.

The complex, discontinuous profile of the bristle array 18 with the "sharp" profile edges formed in the portion 32 of rectangular cross section and at the base 30 of the conical tip portion 28, as well as the progressively shorter bristles terminating in the apex of the core at the distal end 22, provide the user with a diversity of bristle lengths, flexibility, and profile shapes and dimensions to perform the variety of dif-

ferent operations involved in the application of mascara. In particular, the relatively sharp edge of the base 30 of the conical tip 28 acts to align precisely part of the mascara brush 10 with specific parts of the eyelashes. In addition, the longer bristles of the portion 32 of rectangular cross section form two opposed narrow longitudinal brushes 38 and 40 which, with their abrupt edges, serve as combs affording line to line contact rather than tangential contact enabling an effective combing action that facilitates the even application of the mascara. This comb section 32 somewhat resembles a toothbrush with its four edges permitting slight penetration of the eyelashes and thus providing a combing action.

Other geometric cross sections can also perform the several types of applicator action afforded by the invention. For example, the arrowhead-shaped portion 28 can be bullet-shaped or hemispherical rather than conical.

The embodiment of Figs 4-5 has a distal portion 42 of the bristle array tapering toward the distal end 22 of the wire core 11 and of circular cross section throughout, achieving its greatest cross-sectional area at its proximal end or geometric base 44. The profile of portion 42, however, is eccentric to the axis of core 11; thus, on one side 46 of the brush, the bristles are cut to a uniform short length throughout the axial extent of portion 42, becoming progressively longer toward the other side of the brush. The proximal portion 48 of the bristle array (contiguous to, and disposed in tandem with, portion 42) is cut to a cylindrical profile of very short bristles about equal in length to the bristles on the short side 46 of portion 42. Except at side 46, therefore, there is an abrupt discontinuity of profile between the base 44 of portion 42 and the distal end of portion 48.

In this structure, the enlarged, tapered distal portion 42 of the bristle array and its base 44 perform functions similar to those of the arrowhead tip portion 28 of Figs. 1-3. The very short bristles both on side 46 of portion 42 and throughout portion 48 are relatively stiff, owing to their small aspect (length/diameter) ratio, and thus afford good combing action, while the more flexible long bristles near the base 44 of portion 42 (and away from side 46) are particularly effective for pickup and transport of mascara or the like. Preferably, the bristles used in the embodiment of Fig. 2 are hollow fibers, to provide substantial uniformity of bristle distribution (as opposed to discrete helical rows) especially in the longer-bristle portions of the array.

Each of the described brushes may be made by preparing a brush structure constituted of bristles of initially substantially equal length clamped between and extending radially from helically twisted wires 12, 14, and thereafter cutting the bristles to achieve the desired profile. The brush of the invention, mounted as shown in a container cap, may be housed in a con-

tain r of mascara or the like when not in use, in the same manner as a conventional mascara brush, being thereby protected from contamination. It provides, in a single and easily manipulable brush implement, a diversity of applicator characteristics enabling satisfactory performance of varied cosmetic-applying functions.

It is to be understood that the invention is not limited to the features and embodiments hereinabove specifically set forth but may be carried out in other ways without departure from its scope.

#### Claims

1. A brush for applying mascara or the like, comprising an axially elongated twisted wire core having a proximal end and a distal end, and a multiplicity of bristles clamped in the core and extending radially therefrom to constitute a brush bristle array projecting outwardly around the core over a substantial part of the length of the core, wherein the bristle array has a discontinuous profile including at least two axially extended portions differing from each other in cross-sectional shape and/or size.
2. A brush as defined in claim 1, wherein a first one of said portions is a generally arrowhead-shaped distal portion of the bristle array having a maximum cross-sectional area at its proximal end and tapering therefrom toward the distal end of the wire core; and a second one of said portions, contiguous to and disposed proximally of said first portion, has a uniform cross-section smaller in at least one dimension than the cross-section of the proximal end area of said first portion, such that there is a discontinuity of bristle array profile between said first and second portions.
3. A brush as defined in claim 2, wherein the bristles of said second portion are cut to provide a profile having an elongated rectangular cross section.
4. A brush as defined in claim 3, wherein said rectangular cross section has a long dimension substantially equal to the cross-sectional diameter of the proximal end of said first portion.
5. A brush as defined in claim 2, wherein the bristles of said second portion are cut to provide a cylindrical profile of small cross-sectional diameter coaxial with the wire core, and the bristles of said first portion are cut, in progressively varying lengths, to provide an enlarged arrowhead-shaped tip disposed eccentrically of the wire core with a maximum cross-sectional diameter substantially larger than the cross-sectional diameter of said

first portion.

6. A brush as defined in any one of the preceding claims, wherein said proximal end of said first portion has a relatively sharp edge to align precisely a mascara-bearing part of the brush with specific parts of a user's eyelashes and wherein said second portion has longitudinal edges functioning as a comb to facilitate the even application of mascara.
7. A brush as defined in any one of the preceding claims, wherein said proximal end of said core engages an end of a stem secured at its other end within a cosmetics container cap.
8. A brush for applying mascara or the like, wherein the bristle array has a discontinuous profile including at least two axially extended portions differing from each other in cross-sectional shape and/or size.

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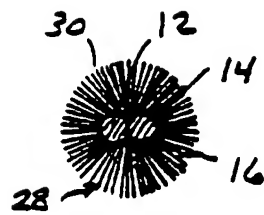
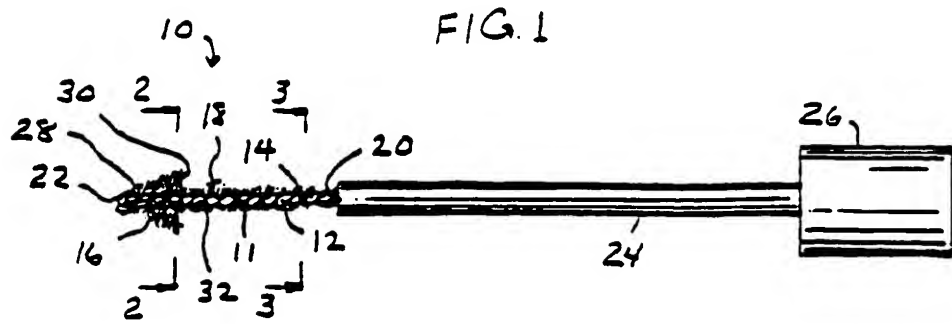


FIG. 2

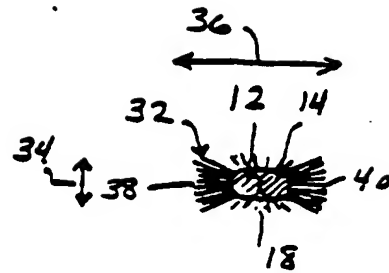


FIG. 3

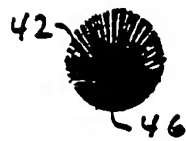
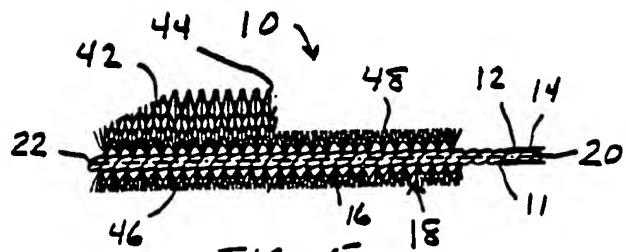


FIG. 4



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## EUROPEAN SEARCH REPORT

Application Number

EP 92 30 3851

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 8)
X	GB-A-2 170 996 (PLOUGH INC) " claim 1; figure 3 "	1, 7, 8	A4689/02
A	US-A-4 403 624 (MONTGOMERY) " figures "	1, 8	
A	GB-A-2 225 225 (L'OREAL) " page 1, line 1 - page 2, line 22; figures "	1, 8	
A	FR-A-2 605 505 (L'OREAL) " figures "	1, 8	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 8)
			A468
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07 AUGUST 1992	Examiner ERNST R. T.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  A : member of the same patent family, corresponding document</p>			

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